

These DRAFT regulations include citations to other draft regulations that have not yet been adopted, but are in the regulatory process. For example, Section 60320.080(d)(4)(B) of these DRAFT regulations refers to "Section 64533, chapter 15.5, title 22." The DHS regulations that include Section 64533 have not yet been adopted; however, a draft version is in [future regulations](#) [see Disinfection Byproducts, R-62-00].

This draft reflects the Department of Health Services' current thinking on the regulation of recharge of groundwater with recycled water. Any informal comments you might have on this draft can be emailed to Bob Hultquist, at bhultqui@dhs.ca.gov or to Jeff Stone, at jstone1@dhs.ca.gov

**Title 22, CALIFORNIA CODE OF REGULATIONS
DIVISION 4. ENVIRONMENTAL HEALTH
CHAPTER 3. RECYCLING CRITERIA**

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ARTICLE 1. DEFINITIONS

Section 60301.080. 24-hour Composite Sample.

"24-hour composite sample" means a combination of no fewer than eight individual samples obtained at equal time intervals during a 24-hour period, such that the volume of each individual sample is proportional to the flow at the time of sampling.

NOTE: Authority cited: Section 100275, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60301.120. Aquifer.

"Aquifer" means a geologic formation, group of formations, or portion of a formation capable of yielding significant quantities of ground water to wells or springs.

NOTE: Authority cited: Section 100275, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60301.190. Diluent Water.

"Diluent water" means water that is not treated wastewater that is used to determine the RWC.

NOTE: Authority cited: Section 100275, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60301.370. Groundwater.

“Groundwater” means water below the land surface in a saturated zone.

NOTE: Authority cited: Section 100275, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60301.380. Groundwater Basin.

“Groundwater basin” means a subsurface structure having the character of a basin with respect to the collection, retention, and outflow of water or an aquifer or system of aquifers, whether basin-shaped or not, that has reasonably well defined boundaries and more or less definite areas of recharge and discharge.

NOTE: Authority cited: Section 100275, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60301.390. Groundwater Recharge Reuse Project (GRRP).

“Groundwater recharge reuse project (GRRP)” means a project that uses recycled water and has been planned and is operated for the purpose of recharging a groundwater basin designated in the Water Quality Control Plan [defined in Water Code section 13050(j)] for use as a source of domestic water supply, and that has been identified as a Groundwater Recharge Reuse Project by a RWQCB.

NOTE: Authority cited: Section 100275, Health and Safety Code and Section 13521, Water Code.
Reference: Sections 13520, 13521, and 13050(j), Water Code.

Section 60301.610. Mound.

“Mound” means a localized, temporary elevation in a water table that builds up as a result of the localized downward percolation of waters that have been discharged to a spreading area.

NOTE: Authority cited: Section 100275, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60301.670. Project Sponsor.

"Project sponsor" means an agency or agencies that receives water recycling requirements for a GRRP from a RWQCB.

NOTE: Authority cited: Section 100275, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60301.680. Public Water System.

"Public water system" means a system for the provision of water for human consumption through pipes or other constructed conveyances that has 15 or more service connections or regularly serves at least 25 individuals daily at least 60 days out of the year. A public water system includes the following:

(a) Any collection, treatment, storage, and distribution facilities under control of the operator of the system which are used primarily in connection with the system.

(b) Any collection or pretreatment storage facilities not under the control of the operator that are used primarily in connection with the system.

(c) Any water system that treats water on behalf of one or more public water systems for the purpose of rendering it safe for human consumption.

NOTE: Authority cited: Section 100275, Health and Safety Code and Section 13521, Water Code. Reference: Section 116275(h), Health and Safety Code.

Section 60301.690. Recycled Water.

"Recycled water" means water, which, as a result of treatment of waste, is suitable for a direct beneficial use or a controlled use that would not otherwise occur and is therefore considered a valuable resource.

NOTE: Authority cited: Section 100275, Health and Safety Code and Section 13521, Water Code. Reference: Section 13050, Water Code.

Section 60301.705. Recycled Water Contribution (RWC).

“Recycled water contribution (RWC)” means the quantity of recycled water applied at the GRRP spreading area or subsurface injection facility divided by the sum of the recycled water applied at the GRRP spreading area or subsurface injection facility and the diluent water.

NOTE: Authority cited: Section 100275, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60301.770. RWQCB.

“RWQCB” means Regional Water Quality Control Board.

NOTE: Authority cited: Section 100275, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60301.780. Saturated Zone.

“Saturated zone” means an underground zone in which all interstices in and between natural geologic materials are filled with water.

NOTE: Authority cited: Section 100275, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60301.810. Spreading Area.

“Spreading area” means an area where water is applied to the land surface for purposes of recharging the groundwater.

NOTE: Authority cited: Section 100275, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60301.840. Subsurface Injection.

“Subsurface injection” means the application of water to the groundwater basin by the controlled insertion of water below the ground surface.

NOTE: Authority cited: Section 100275, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60301.850. Surface Spreading.

"Surface spreading" means the controlled application of water to the spreading area resulting in the recharge of a groundwater basin.

NOTE: Authority cited: Section 100275, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60301. 860. Total Nitrogen.

"Total nitrogen" means the sum of ammonia, nitrite, nitrate, and organic nitrogen concentrations, expressed as nitrogen.

NOTE: Authority cited: Section 100275, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60301.870. Total Organic Carbon (TOC).

"Total organic carbon (TOC)" means oxidizable organic carbon measured by an approved laboratory using a method designated by the Department.

NOTE: Authority cited: Section 100275, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60302. Source Specifications.

The requirements in this chapter shall apply only to recycled water of municipal wastewater origin.

NOTE: Authority cited: Section 13521, Water Code.
Reference: Sections 13520 and 13521, Water Code.

ARTICLE 5.1. PLANNED GROUNDWATER RECHARGE REUSE PROJECTS**~~Section 60320. Groundwater Recharge.~~**

~~(a) Reclaimed water used for groundwater recharge of domestic water supply aquifers by surface spreading shall be at all times of a quality that fully protects public health. The State Department of Health Services' recommendations to the Regional Water Quality Control Boards for proposed groundwater recharge projects and for expansion of existing projects will be made on an individual case basis where the use of reclaimed water involves a potential risk to public health.~~

~~(b) The State Department of Health Services' recommendations will be based on all relevant aspects of each project, including the following factors: treatment provided; effluent quality and quantity; spreading area operations; soil characteristics; hydrogeology; residence time; and distance to withdrawal.~~

~~(c) The State Department of Health Services will hold a public hearing prior to making the final determination regarding the public health aspects of each groundwater recharge project. Final recommendations will be submitted to the Regional Water Quality Control Board in an expeditious manner.~~

Note: Authority cited: Section 100275, Health and Safety Code and Section 13521, Water Code.

Reference: Section 13520, Water Code.

Section 60320. General Requirements.

(a) All recycled water used for a GRRP shall be from a wastewater management agency that administers an industrial pretreatment and pollutant source control program that includes contaminants specified by the Department based on a review that includes the engineering report and other available data on potential groundwater contaminants. The source control program shall include:

(1) An assessment of the fate of the specified contaminant compounds through the wastewater and recycled water treatment systems.

(2) A source investigation and monitoring program focused on the specified contaminants.

(3) An outreach program to industrial, commercial and residential communities within the sewage collection agency's service area to manage and minimize the discharge of compounds of concern at the source.

(4) A program for maintaining an inventory of compounds discharged into the wastewater collection system so that new compounds of concern can be evaluated rapidly.

(b) Prior to the onset of operation for new GRRP's, or during the first year of operation after the effective date of this section for existing GRRP's, each GRRP shall have in place an approved plan providing for an alternative source of domestic water supply, or Department approved treatment mechanism, to any user whose producing well is found to violate California drinking water standards as a result of the GRRP, or when the Department finds that the groundwater has been degraded to the degree that it is no longer a safe source of drinking water as a result of the GRRP.

(c) The State Department of Health Services will hold a public hearing for each GRRP prior to submitting its recommendations for the initial permit to the RWQCB, and at any time an increase in RWC has been proposed.

NOTE: Authority cited: Section 100275, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60320.010. Control of Pathogenic Microorganisms.

(a) For each GRRP, the wastewater shall be treated to meet the following:
(1) The definition of filtered wastewater, pursuant to section 60301.320;
and
(2) The definition of disinfected tertiary recycled water, pursuant to Section 60301.230.

(b) If the recycled water being used for surface spreading or subsurface injection has not been treated to meet the criteria in sections 60301.230 and 60301.320, pursuant to section 60321 (Sampling and Analysis), the GRRP shall:
(1) Suspend surface spreading or subsurface injection of the recycled water until the criteria is met; and
(2) Inform the Department and the RWQCB in the next monthly report.

(c) For a surface spreading project, all the recycled water shall be retained underground for a minimum of six months prior to extraction for use as a drinking water supply, and shall not be extracted within 500 feet of any GRRP surface spreading area. *(Also, see Section 60320.095. Alternatives)*

(d) For a subsurface injection project, all the recycled water shall be retained underground for a minimum of twelve months prior to extraction for use as a drinking water supply, and shall not be extracted within 2000 feet of any GRRP subsurface injection well. *(Also, see Section 60320.095. Alternatives)*

NOTE: Authority cited: Section 100275, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60320.020. Control of Nitrogen Compounds.

(a) To demonstrate control of the nitrogen compounds in the recycled water, each GRRP shall comply with either subsection (a)(1), (a)(2), or (a)(3). **(See ENDNOTE 7)**

(1) The GRRP shall:
(A) Each week, at least three days apart, collect two grab or 24-hour composite samples of recycled water, or the blend of recycled water and diluent

water, prior to surface spreading or subsurface injection, or prior to its reaching the regional groundwater table if the GRRP has been approved for vadose zone or mound monitoring, pursuant to section 60320.050.

(B) Have the samples analyzed for total nitrogen and require the laboratory to complete each analysis within 72 hours and, if the result of any single sample exceeds 5 mg/L, report the result to the GRRP within the same 72 hours.

(C) If the average of two consecutive samples exceeds 5 mg/L total nitrogen, investigate the cause, take appropriate actions to reduce the total nitrogen levels, and notify the Department and the RWQCB within 24 hours of being notified by the laboratory. If the average of all samples collected during the ensuing two weeks exceeds 5mg/l, suspend the surface spreading or subsurface injection of recycled water. Surface spreading or subsurface injection shall not recommence until appropriate corrections are made to reduce total nitrogen levels to below 5 mg/l.

(D) If more than 25% of the samples collected in any two-week period exceed a total nitrogen of 10 mg/L as nitrogen, suspend surface spreading or subsurface injection of recycled water until appropriate corrections are made to reduce total nitrogen levels to below 5 mg/L.

(2) The GRRP shall:

(A) At the frequency specified in the engineering report prepared pursuant to Section 60320.080, collect grab or 24-hour composite samples of recycled water, or the blend of recycled water and diluent water prior to surface spreading or subsurface injection, or prior to its reaching the regional groundwater table if the GRRP has been approved for vadose or mound monitoring pursuant to section 60320.050. Have the samples analyzed for total nitrogen, nitrate, nitrite, ammonia, organic nitrogen, and DO in excess of BOD as described in the engineering report.

(B) As specified in the engineering report prepared pursuant to Section 60320.080, collect and analyze for DO in the groundwater.

(C) Require the laboratory to complete each analysis within 72 hours and report the result to the GRRP within the same 72 hours if the results indicate:

1. Total nitrogen at a level greater than 10 mg/L, and/or
2. Any constituent listed in Paragraphs (A) or (B) at a level greater than a limit identified in the engineering report.

(D) If the average of two consecutive samples is out of compliance with the 10 mg/L total nitrogen limit or a limit identified in the engineering report for another constituent, investigate the cause, take appropriate actions to achieve compliance, notify the Department and the RWQCB within 24 hours of being notified by the laboratory, and suspend surface spreading or subsurface injection of recycled water until an average of two consecutive samples is in compliance.

(3) The GRRP shall:

(A) In the engineering report prepared pursuant to Section 60320.080, provide evidence that over a period of at least 10 years, local surface spreading

or subsurface injection of water containing nitrogen levels at least 75 percent of those existing or projected for the GRRP, has not resulted in nitrate or nitrite levels in the groundwater in excess of MCL's, and that it will be possible to track the movement of water applied by the GRRP at the surface spreading or subsurface injection facility to the downgradient extraction point.

(B) Each month collect two samples of groundwater at each sampling location downgradient of the GRRP spreading area or subsurface injection facility and analyze for nitrite and nitrate.

(C) Require the laboratory to complete each analysis within 72 hours and, if the results indicate nitrate or nitrite at a level greater than the MCL, report the result to the GRRP within the same 72 hours.

(D) If the average of two consecutive samples exceeds an MCL at any sampling location, notify the Department and RWQCB, and either demonstrate compliance has been achieved or suspend the surface spreading or subsurface injection of recycled water.

(b) Each GRRP shall monitor diluent water quarterly for nitrate and nitrite. Within 48 hours of being informed by the laboratory of a nitrate and/or nitrite result greater than an MCL, the GRRP shall collect a confirmation sample. If the average of the two samples is greater than an MCL, the GRRP shall notify the Department and the RWQCB within 48 hours of receiving the confirmation sample result and:

- (1) Investigate the causes and make appropriate corrections;
- (2) Each week collect and analyze two grab or 24-hour composite samples at least three days apart; and
- (3) If the average of all samples collected over the ensuing two-week period exceeds the applicable criterion, suspend surface spreading or subsurface injection of the diluent water until appropriate corrections are made.

NOTE: Authority cited: Section 100275, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60320.030. Control of Regulated Chemicals and Physical Characteristics.

(a) The recycled water shall be in compliance with the following:

- (1) [Primary maximum contaminant levels](#) specified in chapter 15: Inorganic chemicals in table 64431-A (except for nitrogen compounds); radionuclides in table 4, section 64443; organic chemicals in table 64444-A (See Endnote 1)
- (2) [MCLs for disinfection byproducts](#) in section 64533, chapter 15.5;
- (3) [Action levels for lead and copper](#) in section 64678, chapter 15;
- (4) [Secondary MCLs](#) for the constituents and characteristics in tables 64449-A and B ("Upper" levels), chapter 15, with the exception of color.

(b) On a quarterly basis at regular intervals, the GRRP shall collect 24-hour composite or grab samples of the recycled water to determine compliance with paragraphs (a)(1), (2), and (3). The GRRP shall determine compliance on the basis of a running-quarterly average, calculated each quarter using the previous four quarters of data. If the recycled water is out of compliance, the GRRP shall submit a report to the Department and the RWQCB that describes the reasons and the corrective actions taken.

(c) Each year, the GRRP shall collect a representative grab sample of the recycled water to determine compliance with subsection (a)(4); if the single sample result (or average of samples collected during the year, if more than one) exceeds a secondary MCL, the GRRP shall inform the Department and RWQCB and describe the reasons and the corrective actions taken in the next monthly report.

NOTE: Authority cited: Section 100275, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60320.040. Control of Nonregulated Chemicals.

(a) The TOC in any portion of the filtered wastewater that is not subsequently treated with reverse osmosis shall:

(1) Not exceed 16 mg/L for more than two consecutive samples; if the TOC fails to comply with this criteria, the GRRP shall suspend surface spreading or subsurface injection of recycled water until the TOC is reduced to 16 mg/L or less; and

(2) Be monitored as follows:

(A) For one year after initial startup, the GRRP shall collect and analyze a 24-hour composite sample twice a week;

(B) Subsequently, the Department may allow the GRRP to collect and analyze weekly 24-hour composite samples, based on its review of the first year of data.

(b) The Department will specify a maximum average RWC for each GRRP based on its review of the GRRP's engineering report (section 60320.080) and information presented to the Department during hearings on the GRRP.

(1) Once a month, the average RWC shall be calculated by dividing the total volume of recycled water applied at the GRRP spreading area or subsurface injection facility during the preceding 60 calendar months by the sum of the total volume of recycled water applied at the GRRP spreading area or subsurface injection facility and the diluent water applied during that period. If the average RWC exceeds the maximum average RWC, the GRRP shall notify the Department and RWQCB within 7 days and submit a report to both within 60 days describing the reason and corrective actions taken to avoid future occurrences.

(2) The surface spreading or subsurface injection of recycled water shall be distributed over the surface spreading or subsurface injection facilities and over time in such a manner that the maximum RWC will not be exceeded as an average over any 60 month period in any individual aquifer recharged by the GRRP.

(3) Any GRRP that is initiating surface spreading or subsurface injection with recycled water where the groundwater basin had been recharged with diluent water any time during the prior 60 months, may be credited with this diluent water in determining the RWC pursuant to Section 60320.040

(b)(2) provided that:

(A) The GRRP has demonstrated that the diluent water quality used in the calculation has been characterized in accordance with Section 60320.080 (d)(5) and meets all applicable water quality criteria outlined in Sections 60320.020(b), 60320.030 and 60320.040(f)(1)(a).

(B) Documentation of historical diluent water quality and quantity is addressed in the engineering report required pursuant to Section 60320.080.

(C) The GRRP has accurate records of the volume of diluent water applied during the period used in the RWC calculation.

(D) A source water assessment for the diluent water has been conducted.

(c) Any existing GRRP with its existing Department-specified maximum average RWC shall not exceed a TOC level specified by the Department based on its review of the GRRP's historical TOC data and other operational data. The TOC shall be measured as follows:

(1) In the recycled water; or

(2) For a surface spreading project approved for vadose zone or mound monitoring pursuant to section 63020.050, in the recycled water in the vadose zone or mound. (*Also, see Section 60320.095. Alternatives*)

(d) Any new GRRP and any existing GRRP with an increased Department-specified maximum average RWC shall not exceed a TOC level of 0.5 mg/L divided by the Department-specified maximum average RWC, or the recycled water shall be treated by reverse osmosis to do so. For a GRRP using direct subsurface injection, the entire wastewater stream shall be treated with reverse osmosis. The TOC shall be measured as follows:

(1) In the recycled water; or

(2) For a surface spreading project approved for vadose zone or mound monitoring pursuant to section 63020.050, in the recycled water in the vadose zone or mound.

(e) To determine compliance with subsections (b) and (c),

(1) Each week during which the GRRP is recharging the groundwater basin, the GRRP shall collect a 24-hour composite sample, except that if it can be demonstrated that a grab sample is representative of the water quality

throughout a 24-hour period, or if 100 per cent of the wastewater stream is treated by reverse osmosis, the GRRP may collect a grab sample;

(2) Each month, the GRRP shall determine whether the average of the most recent 20 TOC samples exceeds the applicable criterion;

(A) If the criterion is exceeded, the GRRP shall suspend surface spreading or subsurface injection of the recycled water until the criterion are met and, within 7 days of the suspension, notify the Department and the RWQCB;

(B) New GRRPs shall begin determining compliance as soon as 4 samples have been collected, averaging all available samples up to 20;

(3) If the average of the last four samples exceeds the applicable criterion, the GRRP shall submit a report to the Department and RWQCB within 60 days that describes the reasons and the corrective actions that have been taken to avoid future occurrences.

(f) The GRRP shall conduct the following monitoring (See Endnote 2) and report any detections to the Department and the RWQCB in the next monthly report:

(1) Each quarter during the first year of operation the GRRP shall sample and analyze the recycled water for:

(A) [Unregulated chemicals](#) in table 64450, chapter 15;

(B) Priority Toxic Pollutants [chemicals listed in the Water Quality Standards, Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California, and [40 CFR Part 131, Federal Register 65\(97\)](#), May 18, 2000, p. 31682];

(C) Chemicals with [state notification levels](#) that the Department has specified (see Endnote 3), based on a review of the GRRP engineering report and the affected groundwater basin(s); and

(D) Other chemicals that the Department has specified (See Endnote 4) based on a review of the GRRP engineering report and the affected groundwater basin(s).

(2) Subsequently, the Department may allow monitoring to be reduced to annually for the chemicals in paragraphs (1)(A, B, C and D) based on initial sample results.

(3) Annually, the GRRP shall monitor the recycled water for pharmaceuticals, endocrine disrupting chemicals and other chemical indicators of municipal wastewater presence specified by the Department (See Endnote 5), based on a review of the GRRP engineering report and the affected groundwater basin(s).

NOTE: Authority cited: Section 100275, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60320.050. Vadose Zone and Mound Monitoring for TOC and Nitrogen Compounds.

To obtain approval for vadose zone or mound monitoring in a surface spreading project, a GRRP shall demonstrate the following to the Department:

(a) For TOC monitoring, that vadose zone or mound samples are representative of undiluted recycled water or that the TOC sample can be used to determine the degree of recycled water TOC reduction through the soil treatment;

(b) For the nitrogen compound monitoring, that vadose zone or mound samples are representative of recycled water and diluent water applied at the GRRP spreading area or subsurface injection facility; and

(c) That the vadose zone or mound monitoring is representative of conditions throughout the spreading area.

NOTE: Authority cited: Section 100275, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60320.060. Department-Specified Maximum Average RWC Greater than 0.50.

(a) A GRRP may apply to increase the Department-specified maximum average RWC for a GRRP to greater than 0.50 by submitting a proposal to the Department. The proposal shall include a comprehensive report prepared and signed by an engineer registered in California and experienced in the fields of wastewater treatment and public water supply; the report shall include, but not be limited to:

(1) GRRP operations, monitoring, and compliance data;

(2) A demonstration that the water applied at the GRRP spreading area or subsurface injection facility with an average RWC of at least 0.4 has reached at least one GRRP monitoring well for at least one year and the GRRP has been in compliance with the existing Department-specified maximum average RWC,

(3) A demonstration that the water quality data collected at the monitoring well used in the demonstration in subparagraph (2) meets all the primary drinking water standards for the parameters specified pursuant to section 60320.070(b)(2).

(4) Any additional analytical and/or treatment studies requested by the Department to make the determination in subsection (b);

(5) Validation of appropriate construction and siting of monitoring wells;

(6) Scientific peer review by an advisory panel that includes, as a minimum, a toxicologist, a registered engineering geologist or hydrogeologist, an engineer registered in California and experienced in the fields of wastewater treatment and public water supply, a microbiologist, and a chemist; and

- (7) An updated engineering report.
- (b) Prior to the GRRP's proceeding with an increase in the RWC,
 - (1) The Department will determine and specify the increment(s) for the increase based on its review of the Engineering Report submitted under subsection (a); and
 - (2) The project sponsor shall obtain written approval from the Department and the RWQCB.
- (c) A GRRP with a Department-specified maximum average RWC greater than 0.50 shall:
 - (1) Provide advanced oxidation treatment subsequent to any reverse osmosis membrane treatment provided to achieve at least a 1.2 log reduction of NDMA and at least a 0.5 log reduction of 1-4 Dioxane (See Endnote 6); and
 - (2) Conduct a Tentatively Identified Chemicals (TIC) analysis of the recycled water every year.

NOTE: Authority cited: Section 100275, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60320.065. Operation Optimization.

- (a) During the first year of operation for new GRRP's, or during the first year of operation after the effective date of this section for existing GRRP's, operation of all treatment processes shall be optimized to reduce contaminant levels, including:
 - (1) regulated contaminants identified in Section 60320.030, and
 - (2) nonregulated contaminants identified in Section 60320.040.
- (b) Each GRRP shall update the operations plan developed pursuant to Subsection 60320.080(a) to include the procedures identified pursuant to Subsection 60320.065(a).

NOTE: Authority cited: Section 100275, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60320.070. Monitoring Between GRRP and Downgradient Drinking Water Supply Wells.

- (a) Each GRRP shall site and construct monitoring wells, as follows:
 - (1) At a location between one and three months travel time from the surface spreading or subsurface injection area and at an additional point or points between the surface spreading or subsurface injection area and the

nearest downgradient domestic water supply well as specified pursuant to Section 60320.080(d)(10); and

(2) Such that samples can be obtained independently from each aquifer potentially conveying the water that was recharged by the GRRP.

(b) Monitoring shall be conducted and reported as follows:

(1) Each quarter, at a minimum, samples shall be collected at each monitoring well;

(2) Each sample shall be analyzed for TOC, total nitrogen, nitrate, nitrite, constituents and characteristics in tables 64449-A and B, total coliform levels, and any water quality constituents specified by the Department based on the results of the recycled water monitoring conducted pursuant to this chapter; and

(3) If any of the monitoring results indicates that an MCL has been exceeded or that coliforms are present, the GRRP shall notify the Department and the RWQCB within 48 hours of receiving the result.

(4) All monitoring results shall be noted in the monthly report to the Department and the RWQCB.

(c) Analytical results for chemicals shall be reported directly to the Department and the RWQCB, as follows:

(1) Analytical results of all analyses completed in a calendar month shall be reported to the Department and the RWQCB no later than the end of the following month.

(2) Analytical results shall be reported to the Department electronically using the Electronic Deliverable Format as defined in The Electronic Deliverable Format (EDF) Version 1.2i Guidelines & Restrictions dated April 2001 and Data Dictionary dated April 2001.

NOTE: Authority cited: Section 100275, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60320.080. Engineering Report.

(a) Any project sponsor proposing a GRRP shall submit an [engineering report](#) that includes an operations plan to the RWQCB and the Department. This report shall be prepared by an engineer registered in California and experienced in the fields of wastewater treatment and public water supply, in conjunction with a geologist experienced in hydrogeology and registered in California.

(b) GRRPs shall not spread or inject recycled water until the project sponsor submits a complete engineering report to the RWQCB and the Department and receives a permit from the RWQCB.

(c) For a GRRP with a permit from the RWQCB as of the effective date of this regulation, the project sponsor shall submit an engineering report pursuant to this section to the RWQCB(s) and the Department within two years.

(d) The engineering report shall consist of a comprehensive investigation and evaluation of the GRRP, impacts on the existing and potential uses of the impacted groundwater basin, and the proposed means for achieving compliance with sections 60320.010 through 60320.050 and sections 60325 through 60355. The engineering report shall include, but not be limited to, the following:

(1) A description of the proposed GRRP, including the anticipated TOC level and proposed RWC;

(2) An engineering plan of the recycling plant, transmission facilities, spreading basins/subsurface injection wells, and monitoring wells;

(3) A hydrogeologic study on the impacted groundwater basin that addresses the following:

(A) Impact of the GRRP on domestic groundwater sources;

(B) Description of any other existing or proposed GRRPs that could impact the groundwater basin, and an estimate of the cumulative impact on water quantity and quality with and without the proposed GRRP;

(C) Sources of groundwater basin recharge water, areas of surface spreading or subsurface injection, groundwater quantity, quality, and flow patterns for all aquifers in all impacted groundwater basins;

(D) The horizontal and vertical extent of the underground zone within which the recycled water has not been retained for the period of time or distance specified in subsection 60320.010(c) or (d), as applicable;

(E) For new projects, a description of the pre-project groundwater quality in the impacted groundwater basin;

(F) For all wells that will be impacted by the proposed project

1. Use of each;

2. Identification of well(s) subject to the maximum average

RWC; and

3. The estimated or measured shortest recycled water retention time underground and horizontal separation, along with the methods for obtaining these;

(G) Quantitative descriptions of the aquifer transmissivity, groundwater movement, historic depth-to-groundwater, safe yield of the basin, influence of localized pumping, and usable storage capacity of the groundwater basin; and

(H) Description of any existing or anticipated flows into, or recharges of, the basin that could affect the quality of water in the monitoring wells or drinking water wells downgradient of the GRRP.

(4) For the wastewater, treated wastewater, or recycled water proposed for use by the GRRP, the results of one year of quarterly monitoring for:

(A) TOC, BOD, SS, total coliforms, and total nitrogen;

(B) All [regulated and unregulated chemicals](#) listed in sections 64431, 64439, 64441, 64443, 64444, 64449, and 64450, chapter 15, and section 64533, [chapter 15.5](#), title 22;

(C) Lead and copper;

(D) Priority Toxic Pollutants [chemicals listed in the Water Quality Standards, Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California, and [40 CFR Part 131, Federal Register 65\(97\)](#), May 18, 2000, p. 31682]; and

(E) Chemicals that have [state notification levels](#) that have been specified by the Department on the basis of vulnerability.

(5) For any diluent waters proposed for use by the GRRP, a source water assessment, and a quantitative and qualitative characterization of the water quality, including temporal variations (e.g. stormwater quality) shall be conducted;

(6) Identification of the agency responsible for preventing the use of groundwater for drinking water within certain areas pursuant to paragraphs (d)(3)(D) and subsection 60320.010(c) and (d), and the mechanism that will be used;

(7) A contingency plan for diversion of recycled water when required pursuant to sections 60320.010(b)(1), 60320.020(a)(1)(C&D), (2)(D) and (3)(D), and 60320.040(a)(1) and (e)(2)(A);

(8) A description of how the data will be obtained and a sample calculation for RWC;

(9) Identification of the maximum average RWC proposed by the project sponsor for the GRRP, pursuant to section 60320.040(e);

(10) A plan for monitoring groundwater flow and water quality in the impacted groundwater basin, including a map of the locations of monitoring wells in the spreading basin and groundwater basin, details on their construction, and a rationale for their siting;

(11) For GRRP's monitoring in the vadose zone or the mound, a description of how compliance with Sections 60320.020 (a)(1) or (2) and 60320.040(c) or (d) will be achieved.

(12) A water quality monitoring plan for the recycled water, diluent water, water in the vadose zone as necessary, water in the mound as necessary and monitoring wells;

(13) A description of the industrial pretreatment and pollutant source control program, pursuant to section 60320(a);

(14) A list of endocrine disrupting chemicals and pharmaceuticals identified in the wastewater, as well as data on the levels where measurable;

(15) For GRRPs using vadose zone or mound monitoring, a description of the vadose zone or mound monitoring program, including the demonstration in section 63020.050; and

(16) An analysis of the GRRP impact that includes a determination of the possible violations or situations that could occur that might pose a risk to public health and a plan with associated costs for mitigating each along with the

financial assurance mechanism that would be utilized. Such violations or situations include, but shall not be limited to:

- (A) RWC;
- (B) Minimum retention time; and
- (C) MCL exceedance or microbiological problem in a drinking water supply well.

(17) An explanation of how the recycled water and diluent water will be distributed over the surface spreading or subsurface injection area and over time to prevent the recycled water fraction in any aquifer from exceeding the maximum RWC.

(e) The operations plan shall include, but not be limited to, the following:

- (1) A description of the operational and management personnel, their qualifications, experience, and responsibilities;
- (2) If RO membrane technology is used, the routine testing procedures for the integrity of the RO membranes and the RO membrane replacement schedule;
- (3) Routine maintenance and performance monitoring for the disinfection system;
- (4) Maintenance and calibration schedules for all monitoring equipment, process alarm set points and response procedures for all alarms;
- (5) Water blending plan, as applicable;
- (6) Maintenance of injection and monitoring wells, and spreading basins;
- (7) Vector control activities related to the GRRP;
- (8) A description of how the GRRP will measure the retention time to demonstrate compliance with subsection 60320.010(c) or (d);
- (9) A list of the pesticides and herbicides used in the spreading facilities; and
- (10) The procedures used to operate for compliance with subsections 60320.040 (b) and (c) or (d)).

NOTE: Authority cited: Section 100275, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60320.090. Annual and Five Year Reports.

(a) Every year, the project sponsor shall provide to the RWQCB, the Department, and all downgradient public drinking water systems a report prepared by an engineer registered in California and experienced in the fields of wastewater treatment and public water supply that includes the following:

- (1) Summary of compliance with the monitoring requirements and criteria in sections 60320.010, 60320.020, 60320.030, 60320.040, and 60320.050;
- (2) Summary of any corrective actions taken as the result of violations and any suspensions of surface spreading or subsurface injection of recycled water; including a schedule for making needed improvements.

(3) Any detections of monitored constituents and any observed trends in the monitoring wells,

(4) Information related to travel of waters applied at the GRRP spreading area or subsurface injection facility, i.e., the leading edge of the recycled/diluent water plume,

(5) A description of any changes in the operation of any unit processes or facilities, and

(6) A description of any anticipated changes, along with an evaluation of their expected impact on subsequent unit processes.

(b) Every five years, the project sponsor shall update the engineering report to address any project changes and submit it to the RWQCB and the Department. The update shall include, but not be limited to, a demonstration:

(1) That the maximum RWC pursuant to subsection 60320.040(b) will not be exceeded,

(2) That the minimum retention time underground pursuant to subsection 60320.010(c) or (d) will be met, and

(3) Any inconsistencies between groundwater model prediction and observation and/or measurement and how they are being dealt with.

NOTE: Authority cited: Section 100275, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60320.095. Alternatives.

(a) The project sponsor may apply to the Department to reduce the distance in subsection 60320.010(c) or (d), if the sponsor can demonstrate with tracer test results and monitoring facilities that the required retention time will be achieved at the proposed alternative distance and can demonstrate compliance with Section 60320.070 (a).

(b) The project sponsor may apply to the Department to use one or more wastewater constituents as a surrogate for nonregulated contaminants (section 60320.040) in place of TOC. Department approval of the alternative will be based on:

(1) Ability to quantify the constituent(s) in the wastewater, recycled water and groundwater samples;

(2) The effect of the engineered and natural treatment systems on the constituents is similar to the effect of the systems on the potential harmful nonregulated components of the organic material in the wastewater and recycled water; at least one of the constituents shall be present in the treated water at a level that enables a determination of constituent reduction through the treatment process; and

(3) Identification of treatment performance standards for the constituent(s) that are as protective of public health as the TOC criteria in section 60320.040.

~~—(c) The project sponsor may apply to the Department to modify the responses to exceeding the total nitrogen limit in subsections 60320.020, if it can demonstrate that it can track the volume of water applied at the GRRP facilities containing high nitrogen levels as it moves from the surface spreading or subsurface injection area to drinking water wells, and that, based on sufficient data from pertinent monitoring, it can ensure that the nitrate-N or nitrite-N MCLs have not been and will not be exceeded at any time in drinking water supply wells.~~ **NOTE: THE 3 OPTIONS OUTLINED IN 60320.020 NOW ADDRESS THIS ALTERNATIVE**

(c) The project sponsor may apply to the Department to use groundwater flow or other potential sources as diluent water for the purpose of calculating the RWC.

NOTE: Additional language is required in this subsection to clarify that the GRRP would have to quantify the additional diluent water with measurements to ensure that the intent of the regulations to control non-regulated chemicals (e.g. TOC) at drinking water wells is achieved on a five-year running average, and ensure that all aquifers are adequately protected.

NOTE: Authority cited: Section 100275, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

ENDNOTES

These endnotes are not part of the draft regulations, but are included to provide readers with additional information and guidance about the intended application of the draft regulations, and the specific contaminants that are or may be involved.

ENDNOTE 1. New state and federal MCLs will be added as they are adopted (e.g., arsenic, radon, perchlorate, chromium-6)

ENDNOTE 2. GRRPs should select methods for nonregulated chemicals according to the following approach:

- *Use drinking water methods, if available.*
- *Use DHS-recommended methods for chemicals in subsection (f) (e.g., 1,2,3-TCP, NDMA).*
- *If there is no DHS-recommended drinking water method for a chemical, and more than a single EPA-approved method is available, use the most sensitive of the EPA-approved methods.*

- If there is no EPA-approved method for a chemical, and more than one method is available from the scientific literature (e.g., peer-reviewed journals), after consultation with DHS, use the most sensitive method.
- If no approved method is available for a specific chemical, the GRRP's laboratory may develop or use its own methods and should provide the analytical methods to DHS for review. Those methods may be used until DHS-recommended or EPA-approved methods are available.
- If the only method available for a chemical is for wastewater analysis (e.g., a chemical listed as a priority pollutant only), sample and analyze for that chemical in the treated wastewater immediately prior to reverse osmosis treatment to increase the likelihood of detection. Use this approach until the GRRP's laboratory develops a method for the chemical in drinking water, or until a DHS-recommended or EPA-approved drinking water method is available.

ENDNOTE 3. These chemicals are selected from DHS' chemicals with notification levels; chemicals already included in analysis required under subsections (f)(1)(A) or (B) are not included here. These chemicals have either been detected at least once in drinking water supplies, or if not detected, they are of interest for some specific reason [e.g., formaldehyde is of interest because it may be a byproduct of certain treatment processes]. The chemicals are: n-butylbenzene, sec-butylbenzene, tert-butylbenzene, carbon disulfide, chlorate, 2-chlorotoluene, diazinon, 1,4-dioxane, formaldehyde, isopropylbenzene, n-propylbenzene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene.

ENDNOTE 4. N-Nitrosodiethylamine (NDEA) and N-Nitrosopyrrolidine are the only two that would be specified by DHS. Monitoring for these nitrosoamines is desired, because of the DHS' experience with N-nitrosodimethylamine (NDMA), a Priority Pollutant and one for which DHS has established a notification level.

ENDNOTE 5. DHS has specified the following endocrine disrupting chemicals, pharmaceuticals and other chemicals for monitoring:

- Hormones: Ethinyl estradiol, 17-B estradiol, estrone
- "Industrial" endocrine disruptors: bisphenol A, nonylphenol and nonylphenol polyethoxylate, octylphenol and octylphenol polyethoxylate, polybrominated diphenyl ethers.
- Pharmaceuticals and other substances: acetaminopen, amoxicillin, azithromycin, caffeine, carbamazepine, ciprofloxacin, ethylenediamine tetra-acetic acid (EDTA), gemfibrozil, ibuprofen, iodinated contrast media, lipitor, methadone, morphine, salicylic acid, and triclosan.

These samples are being collected for information purposes; there are no standards for the contaminants listed below and no standards are anticipated at this time and analytical methods may not be widely available (See Endnote 2).

Some interested parties have asked for some clarification of what would happen if any of these contaminants are found. In response, we offer this: Monitoring for these chemicals is viewed as a diligent way of assessing and verifying recycled water quality characteristics, which can be useful in addressing issues of public perception about the safety of recharge projects. Further, should there be a positive finding, the recharge agency and DHS can give the result due consideration as to whether it is of concern or not. Just what such consideration might entail would depend on the knowns and unknowns of the particular chemical, including its potential health effects at the given concentration, the source of the chemical, as well as possible means of better control to limit its presence, treatment strategies if necessary, and other appropriate actions.

Again, we stress that such monitoring is not for compliance purposes, but for informational use only.

The specific contaminants targeted for monitoring may vary among GRPPs, depending on their individual engineering reports and groundwater basins. If a GRPP has additional reports for its own project using prior data that address chemicals identified below, or reports for its own project using data on other chemicals addressing the effectiveness of the treatment processes in limiting the release of endocrine disruptor chemicals into recharge water, those reports should be made available to DHS to assist in developing a list of chemicals that would build upon or supplement the already available information. A GRPP that has little monitoring information should plan on collecting more analytical data related to endocrine disrupting chemicals and pharmaceuticals in its recharge water. A GRPP that can demonstrate a history of prior sampling, analysis, and related research, as well as an on-going program on endocrine disrupting chemicals and pharmaceutical in its recharge water will likely have fewer contaminants specified by DHS for analysis under this section.

GRPPs will not be required to conduct an ongoing monitoring program for contaminants under this section, unless good indicator chemicals can be identified through this monitoring. Depending on the results of analyses and other information discussed above, required monitoring may be of short duration (e.g., twice a year for two or three years). If good indicator chemicals can be identified, requirements for their monitoring will be considered. This notwithstanding, DHS recommends an ongoing monitoring program for these types of chemicals.

ENDNOTE 6. The current draft proposes establishing log reduction of targeted chemicals rather than specifying a specific treatment scheme and/or dosage for achieving advanced oxidation. However, DHS is considering how to implement a requirement for achieving advanced oxidation that would be effective. DHS continues to seek ideas on how this should be regulated.

ENDNOTE 7. Table summarizing text of Section 60320.020 (Control of Nitrogen Compounds)

	Option (a)(1)	(a)(2)	(a)(3)
Compliance point	Recycled water, or a blend of recycled water and diluent water, in or above the mound	<ul style="list-style-type: none"> Recycled water, or a blend of recycled water and diluent water, in or above the mound for total N Recycled water, or recharge water in or above the mound, for ammonia, organic nitrogen, nitrite, and DO in excess of the BOD as required Groundwater down-gradient of the recharge area for DO as required 	Groundwater down-gradient of the recharge area
Standard(s)	<ul style="list-style-type: none"> 5 mg/L total N as an average 10 mg/L total N at a maximum frequency 	10 mg/L Total N As established by the engineering report for: <ul style="list-style-type: none"> Total N at some level <10 mg/L when used as part of a comprehensive nitrogen control scheme Ammonia, nitrite, and/or organic nitrogen Minimum DO in excess of BOD Minimum DO 	MCLs for NO ₂ and NO ₃
Frequency of sampling	2/wk.	As established by the engineering report	2/mo.
Engineering report	Monitoring plan	<ul style="list-style-type: none"> Identification of chemical or surrogate concentrations that will ensure that the NO₂ and NO₃ MCLs are not exceeded in groundwater down-gradient of the recharge area Identification of the criteria for suspending recharge Baseline monitoring and operations plan Monitoring plan 	<ul style="list-style-type: none"> Evidence that local recharge of water containing similar nitrogen levels over at least 10 years has not caused a problem and that recharge water can be tracked Monitoring plan
Consequence of failure	Investigate, correct and notify based on average of two consecutive samples >5 mg/L and suspend recharge of recycled water based on an average of all samples collected during the ensuing two week >5 mg/L. Suspend recharge if more than 25% of samples collected in any two week period exceed 10 mg/L.	Investigate, correct and notify based on an average of two consecutive samples over the total N standard, any standard for another form of nitrogen, or under the DO - BOD or DO level. Suspend recharge of recycled water based on an average of a number of consecutive samples over the total N standard, any standard for another form of nitrogen, or under the DO - BOD or DO level, identified and justified in the engineering report	Notify, and either demonstrate compliance with (a)(1) or (a)(2) or suspend recharge of recycled water, based on average of two consecutive samples over an MCL.

Rationale	Option relies on such a low limit for the total N in the recycled water that the chance that the NO ₂ or NO ₃ MCL could be exceeded is minute.	Option relies on: <ol style="list-style-type: none">1. A low enough limit for the total N in the recycled water that the chance that a NO₂ or NO₃ MCL could be exceeded is low, combined with2. Some set of limits determined for the specific GRRP and explained in the Engineering Report for nitrite, organic nitrogen and /or ammonia necessary to limit oxidation to NO₂ or NO₃, and some set of minimum levels for an excess DO over BOD requirement in the recycled water and/or a DO requirement in the groundwater as necessary to prevent reduction of NO₃ to NO₂	Option relies on: <ol style="list-style-type: none">1. A demonstration that historic recharge with water containing comparable levels of nitrogen has not caused a problem,2. Evidence that recharge water can be tracked and monitored throughout the flow path, and3. Monitoring to show that the MCLs in for NO₂ and NO₃ are met in the groundwater. Relatively frequent monitoring at locations between the recharge area and down gradient domestic wells is required.
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